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Part no.: 66576100

MLD535-R2L

Multiple light beam safety device receiver



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- Suitable transmitters
- Dimensioned drawings
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- Operation and display
- Part number code
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Technical data

Basic data	
Series	MLD 500
Device type	Receiver
Special design	
Special design	Reflective element for laser alignment aid
Functions	
Functions	Alternative connection for second muting signal Contactor monitoring (EDM), selectable Partial muting Timing controlled 4-sensor muting Muting-timeout extension Muting enable function Start/restart interlock (RES) Timing controlled 2-sensor muting Sequence controlled 2-sensor muting
Characteristic parameters	
Type	4, IEC/EN 61496
SIL	3, IEC 61508
SILCL	3, IEC/EN 62061
Performance Level (PL)	e, EN ISO 13849-1
MTTF _d	204 years, EN ISO 13849-1
PFH _D	6.6E-09 per hour
Mission time T _M	20 years, EN ISO 13849-1
Category	4, EN ISO 13849
Optical data	
Number of beams	2 Piece(s)
Beam spacing	500 mm
Electrical data	
Selection of operating mode	Connection 1, pin 2: +24 V for operating mode 1, 2, 4 Connection 1, pin 2: 0 V for operating mode 3, 5, 6 Connection 1, pin 7: 0 V for operating mode 1, 2, 4 Connection 1, pin 7: +24 V for operating mode 3, 5, 6
Protective circuit	Overvoltage protection Short circuit protected
Performance data	
Supply voltage	24 V, DC, -20 ... 20 %
Current consumption, max.	150 mA, Without external load
Fuse	External with max. 3 A

Inputs	
Number of digital switching inputs	4 Piece(s)
Switching inputs	
Type	Digital switching input
Switching voltage high, min.	18.2 V
Switching voltage low, max.	2.5 V
Switching voltage, typ.	23 V
Voltage type	DC
Switching current, max.	5 mA
Digital switching input 1	
Assignment	Connection 1, pin 1
Function	Control input for start/restart interlock (RES)
Digital switching input 2	
Assignment	Connection 1, pin 3
Function	Control input for contactor monitoring (EDM)
Digital switching input 3	
Assignment	Connection 1, pin 4
Function	Control input, second muting signal
Digital switching input 4	
Assignment	Connection 1, pin 8
Function	Control input, muting enable/ timeout

Outputs

Number of safety-related switching outputs (OSSDs)	2 Piece(s)
Number of digital switching outputs	1 Piece(s)

Safety-related switching outputs

Type	Safety-related switching output OSSD
Switching voltage high, min.	18.2 V
Switching voltage low, max.	2.5 V
Switching voltage, typ.	23 V
Voltage type	DC
Current load, max.	380 mA
Load inductivity	2,200,000 μ H
Load capacity	0.3 μ F
Residual current, max.	0.2 mA
Residual current, typ.	0.002 mA
Voltage drop	1 V

Safety-related switching output 1

Assignment	Connection 1, pin 6
Switching element	Transistor, PNP

Safety-related switching output 2

Assignment	Connection 1, pin 5
Switching element	Transistor, PNP

Switching outputs

Type	Digital switching output
Switching voltage high, min.	18.2 V
Switching voltage low, max.	2.5 V
Switching voltage, typ.	23 V
Voltage type	DC

Switching output 1

Assignment	Connection 1, pin 1
Switching element	Transistor, PNP
Function	"State of OSSDs" signal output

Timing

Response time	50 ms
Restart delay time	100 ms

Connection

Number of connections	2 Piece(s)
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Connection 1

Type of connection	Connector
Function	Machine interface
Thread size	M12
Material	Metal
No. of pins	8 -pin

Connection 2

Type of connection	Connector
Function	Local interface
Thread size	M12
Material	Metal
No. of pins	8 -pin

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Cable properties

Permissible conductor cross section, typ.	0.25 mm ²
Length of connection cable, max.	100 m
Permissible cable resistance to load, max.	200 Ω

Mechanical data

Dimension (W x H x L)	52 mm x 600 mm x 64.7 mm
Housing material	Metal, Aluminum
Lens cover material	Plastic / PMMA
Material of end caps	Diecast zinc
Net weight	1,400 g
Housing color	Yellow, RAL 1021
Type of fastening	Groove mounting Swivel mount

Operation and display

Type of display	LED
Number of LEDs	2 Piece(s)

Environmental data

Ambient temperature, operation	-30 ... 55 °C
Ambient temperature, storage	-40 ... 75 °C
Relative humidity (non-condensing)	0 ... 95 %


Certifications

Degree of protection	IP 67
Protection class	III
Certifications	c TÜV NRTL US TÜV Süd c CSA US
US patents	US 7,741,595 B US 6,418,546 B

Classification

eCl@ss 8.0	27272703
eCl@ss 9.0	27272703
ETIM 5.0	EC001832

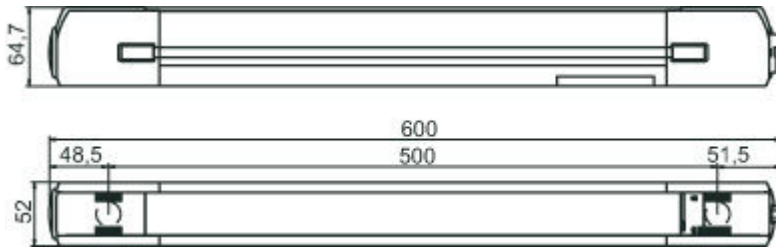
Suitable transmitters

	Part no.	Designation	Article	Description
	66502100	MLD500-T2L	Multiple light beam safety device transmitter	Operating range: 0.5 ... 50 m Number of beams: 2 Piece(s) Beam spacing: 500 mm Connection: Connector, M12, Metal, 5 -pin Special design: Integrated laser alignment aid

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Dimensioned drawings

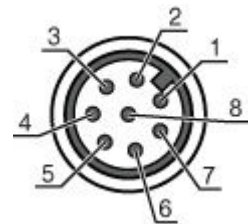
All dimensions in millimeters



Electrical connection

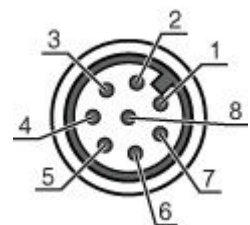
Connection 1	
Type of connection	Connector
Function	Machine interface
Thread size	M12
Type	Male
Material	Metal
No. of pins	8 -pin
Encoding	A-coded

Pin	Pin assignment	Conductor color
1	RES/OSSD status signal	White
2	VIN	Brown
3	EDM	Green
4	MS2	Yellow
5	OSSD2	Gray
6	OSSD1	Pink
7	VIN	Blue
8	M-EN/TO	Red



Connection 2	
Type of connection	Connector
Function	Local interface
Thread size	M12
Type	Female
Material	Metal
No. of pins	8 -pin
Encoding	A-coded

Pin	Pin assignment	Conductor color
1	MS4	White
2	+24V	Brown
3	MS2	Green
4	MS1	Yellow
5	RES/LMP	Gray



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Pin	Pin assignment	Conductor color
6	MS3	Pink
7	0 V	Blue
8	n.c.	Red

Operation and display

LEDs

LED	Display	Meaning
1	Red, continuous light	OSSD off.
	Green, continuous light	OSSD on
	Red, flashing, 1 Hz	External error
	Red, flashing, 10 Hz	Internal error
	Green, flashing, 1 Hz	Weak signal, device not optimally aligned or soiled.
2	Yellow, continuous light	Start/restart interlock locked.















Part number code

Part designation: **MLDxyy-zab/t**

MLD	Multiple light beam safety device
x	Series: 3: MLD 300 5: MLD 500
yy	Function classes: 00: Transmitter 10: automatic restart 12: external testing 20: EDM/RES 30: muting 35: timing controlled 4-sensor muting
z	Device type: T: transmitter R: receiver RT: transceiver xT: transmitter with high range xR: receiver for high range
a	Number of beams
b	Option: L: integrated laser alignment aid (for transmitter/receiver) M: integrated status indicator (MLD 320, MLD 520) or integrated status and muting indicator (MLD 330, MLD 335, MLD 510/A, MLD 530, MLD 535) E: connection socket for external muting indicator (AS-i models only)
/t	Safety-related switching outputs (OSSDs), connection technology: -: transistor output, M12 plug A: integrated AS-i interface, M12 plug, (safety bus system)





Accessories

Connection technology - Connection cables


	Part no.	Designation	Article	Description
  	678064	CB-M12-50000E-8GF	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 50,000 mm Sheathing material: PUR
  	50135128	KD S-M12-8A-P1-050	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 5,000 mm Sheathing material: PUR
  	50135129	KD S-M12-8A-P1-100	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 10,000 mm Sheathing material: PUR
  	50135130	KD S-M12-8A-P1-150	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 15,000 mm Sheathing material: PUR
  	50135131	KD S-M12-8A-P1-250	Connection cable	Connection 1: Connector, M12, Axial, Female, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 25,000 mm Sheathing material: PUR
  	50135139	KS S-M12-8A-P1-050	Connection cable	Connection 1: Connector, M12, Axial, Male, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 5,000 mm Sheathing material: PUR
  	50135140	KS S-M12-8A-P1-100	Connection cable	Connection 1: Connector, M12, Axial, Male, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 10,000 mm Sheathing material: PUR
  	50135141	KS S-M12-8A-P1-150	Connection cable	Connection 1: Connector, M12, Axial, Male, A-coded, 8 -pin Connection 2: Open end Shielded: Yes Cable length: 15,000 mm Sheathing material: PUR

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Mounting technology - Swivel mounts

	Part no.	Designation	Article	Description
	560340	BT-SET-240BC	Mounting bracket set	Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Clampable Type of mounting device: Turning, 240° Material: Metal
	540350	BT-SET-240BC-E	Mounting bracket set	Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Clampable Type of mounting device: Turning, 240° Material: Metal, Plastic
	560342	BT-SET-240BCS	Mounting bracket set	Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Clampable Type of mounting device: Turning, 240°, Shock absorber Material: Metal Shock absorber: Yes
	540352	BT-SET-240BCS-E	Mounting bracket set	Mounting bracket, at system: Through-hole mounting Mounting bracket, at device: Clampable Type of mounting device: Shock absorber, Turning, 240° Material: Metal, Plastic Shock absorber: Yes

Mounting technology - Other




	Part no.	Designation	Article	Description
	424417	BT-2P40	Mounting bracket set	Contains: 2x BT-P40 clamp bracket Design of mounting device: Mounting clamp Mounting bracket, at system: Groove mounting Mounting bracket, at device: Groove mounting Type of mounting device: Clampable Material: Metal

Muting - Mounting systems


	Part no.	Designation	Article	Description
	426492	Set-AC-MT-4S	Muting sensor set	Operating range: 0 ... 4 m Cable length of muting sensors: 300 mm Type of muting sensors: Retro-reflective photoelectric sensors PRK 3B Number of muting sensors: 4 Piece(s) Number of reflectors: 4 Piece(s)
	426522	Set-AC-MTX-4S	Muting sensor set	Operating range: 0 ... 8 m Cable length of muting sensors: 300 mm Type of muting sensors: PRK 25B retro-reflective photoelectric sensors Number of muting sensors: 4 Piece(s) Number of reflectors: 4 Piece(s)
	426528	Set-AC-MTX.2-4S	Muting sensor set	Operating range: 0 ... 8 m Cable length of muting sensors: 2,000 mm Type of muting sensors: PRK 25B retro-reflective photoelectric sensors Number of muting sensors: 4 Piece(s) Number of reflectors: 4 Piece(s)

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Muting - Connection technology

	Part no.	Designation	Article	Description
	520140	AC-SCM6U	Sensor connection module	Suitable for: MLD 335, MLD 535 multiple light beam safety devices Supply voltage: 24 V, DC, -20 ... 20 % Number of connections: 7 Piece(s) Connection: Cable with connector, M12, 500 mm Type of fastening: Through-hole mounting, Groove mounting
	520141	AC-SCM6U-BT	Sensor connection module	Suitable for: MLD 335, MLD 535 multiple light beam safety devices Supply voltage: 24 V, DC, -20 ... 20 % Number of connections: 7 Piece(s) Connection: Cable with connector, M12, 500 mm Type of fastening: Mounting plate
	520142	AC-SCM6U-BT-L	Sensor connection module	Suitable for: MLD 335, MLD 535 multiple light beam safety devices Supply voltage: 24 V, DC, -20 ... 20 % Number of connections: 7 Piece(s) Connection: Cable with connector, M12, 500 mm Type of fastening: Mounting plate with L-angle






Display/operating elements

	Part no.	Designation	Article	Description
	426296	AC-ABF70	Acknowledgment unit	Switching current via button: 1 ... 1,000 mA Housing material: Glass fiber reinforced (PPS), self-extinguishing Clamping plate material: Stainless steel Degree of protection: IP 67, IP 69K Functions: Reset of the start/restart interlock, Overriding with AOPDs with muting function, Illuminated reset buttons Reset buttons: Yes LED indicators: Yes

Device columns

	Part no.	Designation	Article	Description
	549856	UDC-1000-S2	Device column	Dimensions: 160 mm x 1,060 mm x 149 mm Column height without foot: 1,000 mm Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions
	549879	UDC-1140-S2	Device column	Dimensions: 160 mm x 1,200 mm x 149 mm Column height without foot: 1,140 mm Functions: Adjustable, 3 directions, Mounting and protection of light curtains and multiple light beam devices
	549852	UDC-1300-S2	Device column	Dimensions: 160 mm x 1,360 mm x 149 mm Column height without foot: 1,300 mm Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions
	549853	UDC-1600-S2	Device column	Dimensions: 160 mm x 1,660 mm x 149 mm Column height without foot: 1,600 mm Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions

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	Part no.	Designation	Article	Description
	549854	UDC-1900-S2	Device column	Dimensions: 160 mm x 1,960 mm x 149 mm Column height without foot: 1,900 mm Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions
	549867	UDC-2100-S2	Device column	Dimensions: 160 mm x 2,160 mm x 149 mm Column height without foot: 2,100 mm Functions: Adjustable, 3 directions, Mounting and protection of light curtains and multiple light beam devices
	549857	UDC-2500-S2	Device column	Dimensions: 160 mm x 2,560 mm x 149 mm Column height without foot: 2,500 mm Functions: Adjustable, 3 directions, Mounting and protection of light curtains and multiple light beam devices
	549865	UDC-3100-S2	Device column	Dimensions: 160 mm x 3,160 mm x 149 mm Column height without foot: 3,100 mm Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions
	549855	UDC-900-S2	Device column	Dimensions: 160 mm x 960 mm x 149 mm Column height without foot: 900 mm Functions: Mounting and protection of light curtains and multiple light beam devices, Adjustable, 3 directions